PATENT APPLICATION

IN THE U.S. PATENT AND TRADEMARK OFFICE

April 5, 2004

Applicant(s): Dudley S. CHILDRESS et al.
For: SHAPE AND ROLL PROSTHETIC FOOT
Serial No.: 10/700 358 Group: 3738
Confirmation No.: 5248
Filed: November 3, 2003 Examiner: Unknown
Atty. Docket No.: HANS

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PRELIMINARY AMENDMENT

Dear Sir:

Please amend the above application as follows:

1) IN THE SPECIFICATION

On page 1 please insert the following paragraph after the first paragraph:

CONTRACTUAL ORIGIN OF THE INVENTION

The invention described in this application was made under a grant from the Department of Education (National Institute on Disability and Rehabilitation Research, grant No. H133E980023). The Government may have certain rights in the invention.

On page 4 please substitute the following paragraph for the second full paragraph:

The invention provides a prosthetic foot for use by a person with lower limb amputation in a manner to gradually transfer walking load from heel to the toe. During this period of time, the stance knee traverses a somewhat level path over the foot in the direction of walking. The precise location of the knee joint with respect to the ground contact point is influenced primarily by the deformation of the materials of the prosthetic foot and shoe, as well as the tissues of the residual limb. The dynamic actions that are occurring within this time period effectively create a consistent relationship between the knee and ground contact point such that an ~~appropriately~~ appropriate prosthetic foot can produce the same consistent knee-to-ground relationship. The prosthetic foot provides an appropriate roll-over shape as defined above and below to enable a person with lower limb amputation to walk comfortably and smoothly and also provides shock attenuation and energy storage/return to improve the "feel" of walking. The prosthetic foot embodies the dynamics of deflecting the foot under the loads of walking to store energy within the foot structure, which is then released when the foot is undeflected.

On page 7 please substitute the following paragraph for the first full paragraph:

When a load is applied to the prosthetic foot F during a gait cycle of the user, the flexible sole element 10 deflects into an arcuate shape with the maximum deflection limited by the oppositely facing, top transverse edges 20e of the bar segments 20a moving a distance roughly equal to the width of the saw cuts or gaps 22. When the top transverse edges 20e of adjacent bar segments 20a abut respective top edges 20e of adjacent bar segments 20a, the flexible sole element 10 and the tapered bar segments 20a collectively have assumed an approximate circular roll-over shape with a radius of curvature, see Figure 5. The bar segments 20a become rigid and incompressible when their top transverse edges 20e abut against each other and will not deform much more under extra loads as a result of

their shape selected to this end. For example, in Figure 5, if the ~~Forefoot Force~~ forefoot force is increased further, the flexible element 10 prosthetic foot F will not deflect further much more as a result of the abutment of the top transverse edges 20e. The number of saw cuts or gaps 22 and the distance between the sawcuts or gaps are calculated based upon the desired radius of curvature, the height of the rectangular bar 20, and the width of the saw-cuts or gaps 22.

On page 10 please substitute the following paragraph for the first full paragraph:

The prosthetic foot F can be made of a wide variety of materials. For purposes of illustration and not limitation, the foot can be made entirely out of a polypropylene-polyethylene copolymer, because this material is inexpensive, readily available, waterproof and is known for good mechanical properties and aluminum as described above. There are numerous ways to manufacture a prosthetic foot F. A simple way may be compression molding.

On page 11 please substitute the following paragraph for the second full paragraph:

This fabrication method is designed for practice in low-income, undeveloped countries, so that local labor and indigenous materials can ~~he~~ be used to make the prosthetic foot. Other fabrication methods better suited for manufacture in the US or other industrialized countries may include extrusion or injection molding or any other suitable manufacturing method.